Sphincterotome Stricturoplasty for Ampullary Stenoses and Biliary Strictures

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Abstract

Endoscopic sphincterotomy (ES) is performed frequently during therapeutic endoscopic retrograde cholangiopancreatography (ERCP).[1] On cholangiogram, long ampullary stenoses and fibrotic distal biliary strictures are not encountered infrequently and they are defined as a significant narrowing of the common bile duct (CBD) from the level of duodenal wall into CBD after initial ES.[2] The upstream CBD is dilated. Despite adequate ES, the contrast drainage is poor due to the downstream stricture. Instead of balloon stricturoplasty and stenting,[3,4] these strictures can be managed with sphincterotome stricturoplasty (SS) during the initial ERCP.[2]

The SS is performed using the same sphincterotome in a slightly bowed position under endoscopic and fluoroscopic guidance. The cutting wire is placed parallel to the superior border within the stricture and incising the stenosis. In cases of relatively long strictures, during initial SS, the majority of the cutting wire is inside the biliary opening. This differs from ES where about one-third to one-half of the length of cutting wire is outside the ampulla. Compared with balloon stricturoplasty ± biliary stenting, SS is a simple and cost-effective alternative option in managing long ampullary stenosis and/or distal fibrotic biliary stricture during the initial ERCP. This article is part of an expert video encyclopedia.

Keywords

Ampullary stenosis; Balloon stricturoplasty; Biliary stricture; Endoscopy; Endoscopic retrograde cholangiopancreatography; Sphincterotome; Sphincterotomy; Sphincterotome stricturoplasty; Video.

Video Related to this Article

Video available to view or download at doi:10.1016/S2212-0971(13)70233-4

Materials

Standard duodenoscope, fluoroscopy for endoscopic retrograde cholangiopancreatography (ERCP), standard sphincterotome with a 25-mm cutting wire, stone extraction balloon, and ERCP contrast agent.

Background and Endoscopic Procedure

Biliary cannulation, endoscopic sphincterotomy (ES), and sphincterotome stricturoplasty (SS) are achieved with a standard sphincterotome with 25-mm cutting wire. ES and SS are performed with a pure-cut or blended mode. In cases of biliary strictures, initial adequate ES is performed by incising the ampulla into the duodenal wall. After adequate ES, biliary stricture is confirmed by the cholangiographic images: the presence of stricture and poor/non-drainage of contrast. SS should not be considered in patients with acute inflammatory stricture such as acute pancreatitis or when malignant strictures are suspected. In many cases, complete SS is not necessary.

SS is performed using the same sphincterotome in a slightly bowed position under endoscopic and fluoroscopic guidance. The cutting wire is placed parallel to the superior border within the stricture and incising the stenosis. In cases of relatively long strictures, during initial SS, the majority of the cutting wire is inside the biliary opening. This differs from ES where about one-third to one-half of the length of cutting wire is outside the ampulla. Intermittent cutting is performed by applying gentle upward pressure and a half to a full second pulse cutting. By changing pressure on the elevator and position of the bowed sphincterotome, the stricturoplasty is performed at the upper part and distal part within the stricture. Adequacy of SS is suggested by the generous space within the stricture when gently moving the sphincterotome (by turning the endoscopic handle side to side) within the treated stricture, by spontaneous drainage of the contrast, by feeling minimal or no resistance on slowly withdrawing a half-bowed sphincterotome through the stricture, and by visualizing the treated stricture on fluoroscopy during contrast injection proximal to the stricture. After SS, the tip of the inflated balloon can be placed at the biliary opening to obtain balloon occlusion cholangiogram documenting the improvement or resolution of the treated stricture. Optional ampullary biopsy can also be performed within the treated biliary stricture. Biliary stenting is generally not needed or required after SS.

Key Learning Points/Tips and Tricks

- SS is best suited for experienced ERCP endoscopists.
- SS should not be performed if malignant strictures are suspected.
- SS should not be performed in cases of acute inflammatory stricture such as acute pancreatitis.
- SS should not be performed if the distal common bile duct stricture is long due to the higher risk of underlying malignancy and associated procedure complications.

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Complications and Risk Factors

Alternatives

Balloon stricturoplasty, stenting, and biliary bypass surgery.

Scripted Voiceover

Time (min:sec)	*Voiceover text*
00:04	During endoscopic retrograde cholangiopancreatography (ERCP), long ampullary stenoses and fibrotic distal biliary strictures are commonly encountered.
00:15	They are defined as significant narrowing of the common bile duct (CBD) from the level of the duodenal wall into the CBD after initial biliary sphincterotomy.
00:27	The upstream CBD is dilated. Despite adequate sphincterotomy, the contrast drainage is poor due to the downstream stricture.
00:38	Instead of balloon stricturoplasty and stenting, these strictures can be managed with sphincterotome stricturoplasty during the initial ERCP.
00:49	Sphincterotome stricturoplasty is performed using the same sphincterotome in a slightly bowed position under endoscopic and fluoroscopic guidance.
01:00	The cutting wire is placed parallel to the superior border within the stricture and incising the stenosis.
01:08	In cases of relatively long strictures, during initial stricturoplasty, the majority of the cutting wire is inside the biliary opening.
01:20	This differs from sphincterotomy, where about one-third to half the length of cutting wire is outside the ampulla.
01:29	In this case, sphincterotome stricturoplasty is being performed to treat a 13-mm, in length, distal fibrotic biliary stricture.
01:43	Contrast is drained after stricturoplasty.
01:50	Adequacy of stricturoplasty is suggested by the generous space within the stricture when gently moving the sphincterotome by turning the endoscopic handle side to side within the treated stricture.
01:55	After stricturoplasty, the tip of the inflated balloon can be placed at the biliary opening to obtain balloon occlusion cholangiogram, documenting the improvement or resolution of the treated stricture.
02:11	In this case, the fibrotic distal biliary stricture resolved after stricturoplasty.
02:19	Contrast drains spontaneously.
02:28	This patient has symptomatic choledocholithiasis.
02:35	On cholangiogram, long ampullary stenosis or fibrotic distal biliary stricture is seen.
02:38	The upstream duct is dilated and the contrast does not drain.
02:44	Biliary cannulation, sphincterotomy, and stricturoplasty are achieved with a standard sphincterotome with 25-mm cutting wire.
02:55	Initial adequate sphincterotomy is performed by incising the ampulla into the duodenal wall.
03:04	Biliary sphincterotomy and sphincterotome stricturoplasty are performed with pure cut or blended current.
03:13	During biliary sphincterotomy, about half the length of the cutting wire is outside the ampulla.
03:22	In this case, despite initial sphincterotomy, it is difficult to remove a half bowed sphincterotome through the biliary opening due to the underlying stricture.
03:39	Extended biliary sphincterotomy is performed.
03:56	Under endoscopic and fluoroscopic guidance, the sphincterotome is slightly bowed with the cutting wire placed parallel to the superior border within the stricture and incising the stenosis. Improved contrast drain is observed.
04:26	After sphincterotome stricturoplasty, endoscopic balloon sweep is performed to remove any biliary stones and to ensure the adequacy of stricturoplasty.
04:39	Endoscopically, we can observe the treated stricture or stenosis.
04:48	The tip of the inflated balloon can be placed at the biliary opening to obtain balloon occlusion cholangiogram, documenting the improvement or resolution of the treated stricture.
05:04	Ampullary biopsy is performed within the treated stricture.
05:11	After sphincterotome stricturoplasty, biliary stenting is generally not needed or required.
05:22	In the original study describing sphincterotome stricturoplasty, stricturoplasty was performed in 25 patients. The mean length of the stricture was 7.4 mm.
05:35	The presumed etiologies for these strictures included choledocholithiasis and postsphincterotomy stenosis.
05:44	There was no procedure related perforation, bleeding, or post-ERCP pancreatitis.
05:52	Sphincterotome stricturoplasty should not be performed if malignant stricture is suspected, acute inflammatory stricture is encountered, or if the distal common bile duct stricture is too long.
06:09	Thank you for your attention.

References

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